

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

February 18, 2005

TO: Internal File

THRU: D. Wayne Hedberg, Permit Supervisor

FROM: Wayne H. Western, Team Lead

RE: North Lease Subsidence Mining, Canyon Fuel Company LLC, Skyline Mine, C007/0005, Task ID #1976

SUMMARY:

The following analysis is a review of the North Lease Subsidence Mining amendment received by the Division on July 1, 2004. The information provided consists primarily of reports and studies that were outlined to be conducted after the North Lease was originally permitted in November 2002. Reports includes a GPS stream-channel profile survey of Winter Quarters Canyon and Woods Canyon in central Utah, and a report titled, "Riparian Plant Community Survey Near Scofield, Utah". Both reports are submitted as additional baseline information to study the potential effects of subsidence in the North Lease area – primarily in the perennial reaches of Winter Quarters Canyon and Woods Canyon.

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TECHNICAL ANALYSIS:

OPERATION PLAN

MINING OPERATIONS AND FACILITIES

Regulatory Reference: 30 CFR 784.2, 784.11; R645-301-231, -301-526, -301-528.

Analysis:

The Permittee intended that the North Lease subsidence permit modification submittal address all the regulations needed for approval to conduct longwall mining in the North Lease area. The information in the amendment does not adequately update the MRP. The Permittee did not update specific parts of the MRP such as Section 2.5.2, where they state that longwall mining is not allowed in under Winter Quarters Canyon. In addition, Drawing 4.17.1-1, Extent of Planned and Controlled Subsidence Areas, does not even show the addition of the North Lease area.

The Division will not list all sections of the MRP that must be updated if the Permittee plans on conducting full extraction mining in the North Lease area. The Permittee has the responsibility of updating the entire MRP to include longwall mining in the North Lease area.

Findings:

The information in the application is not considered adequate to meet the minimum requirements of the regulations. Before approval, the Permittee must provide the following in accordance with:

R645-301-121.200, The Permittee must update all sections of the MRP that pertain to mining the North Lease. The updates must include all maps and drawings as well as text.

EXISTING STRUCTURES:

Regulatory Reference: 30 CFR 784.12; R645-301-526.

Analysis:

"Existing Structure" means a structure or facility used in connection with or to facilitate coal mining and reclamation operations for which construction began prior to January 21, 1981. There are no such existing structures within the North Lease Area.

Findings:

The information in the amendment is adequate to meet the minimum requirements of this section of the regulations.

RELOCATION OR USE OF PUBLIC ROADS

Regulatory Reference: 30 CFR 784.18; R645-301-521, -301-526.

Analysis:

The Permittee will not relocate or use any additional public roads in connection with the North Lease. There is an old trail in the bottom of Winter Quarters Canyon. That structure should not be affected by subsidence.

Findings:

The information in the application is considered adequate to meet them minimum requirements of the regulations.

COAL RECOVERY

Regulatory Reference: 30 CFR 817.59; R645-301-522.

Analysis:

The Permittee did not update the economic coal recovery plan to include extraction from the North Lease. The Permittee must include a detailed economic coal recovery plan in the amendment or other information that the Division can use to make a finding.

The Division often relies on information in the resource recovery protection plan R2P2. The Division usually finds that the R2P2 contains enough information to make a determination about economic coal recovery.

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Findings:

The information in the application is not considered adequate to meet the minimum requirements of the regulations. Before approval, The Permittee must provide the following in accordance with:

R645-301-522, The plan for maximum economic coal recovery must be updated to include information on the North Lease.

SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

Analysis:

Renewable Resources Survey

The Permittee conducted renewable resource surveys of the North Lease area. The Permittee found that renewable resources such as perennial streams, Woods Canyon Creek and Winter Quarters Creek, are within the permit boundaries. Those subsidence surveys are part of Section 4.17.1 of the MRP.

Subsidence Control Plan

The subsidence control plan must contain the following information:

- *A description of the method of coal removal, such as longwall mining, including the size, sequence, and timing for the development of underground workings.* The Permittee did not state those requirements in the amendment. Map 3.3-2, Lower O'Conner "A"/Flat Canyon Five Year Projected Mine Plan, shows longwall panels in the North Lease. However, in Section 4.17.1 of the MRP, the Permittee states that only development mining will occur in the North Lease. The Permittee does not mention switching from development mining to longwall mining in the amendment.

In a phone conversation between Wayne Western of the Division and Chris Hansen of The Permittee on August 24, 2004, Chris mentioned that the Permittee submitted the amendment as part of the process to get permission to use longwall mining methods in the North Lease area.

The Permittee must clarify their intentions by stating in the amendment that the Permittee seeks approval to conduct longwall mining in the North Lease area. **This deficiency was identified in the Mining Operations and Facilities section of the technical analysis.**

A map of underground workings showing the location and extent of areas where planned-subsidence mining methods will be used and including all areas where measures will be taken to prevent or minimize subsidence and subsidence related damage and where appropriate, to correct subsidence-related material damage. Map 4.17.3-1A, North Lease Presubsidence Survey Map, shows the areas where subsidence is anticipated, the amount of subsidence (potential subsidence contours) and those areas where the Permittee believes that subsidence cracks could occur. All of the areas where the Permittee shows the potential for surface subsidence cracks to occur are on ridges, not in valleys. In a personal conversation between Wayne Western of the Division and Dale Harber of the USFS, Mr. Harber stated that the USFS is concerned that mining under perennial streams, especially perennial streams with less than 600 feet of cover could be damaged by subsidence cracks. The USFS and the Division will use the information on Map 4.17.3-1A in the analysis to determine if mining will cause damage to Woods Creek and Winter Quarters Creek.

Drawing 4.17.1-1, Extent of Planned and Subsidence Areas is out of date and does not show the North Lease area. The map must be updated.

Specific items that must be addressed in the subsidence control plan are:

- *A description of the physical conditions, such as depth of cover, seam thickness, and lithology, which affect the likelihood or extent of subsidence and subsidence-related damage.* The Permittee shows the depth of cover and coal isopachs Map 2.2.7-2, Lower O'Conner "A"/Flat Canyon Overburden Map. The depth of cover ranges from 500 feet to 2,000 feet. The seam thickness is shown on Map 2.2.7-1, Lower O'Conner "A"/Flat Canyon Isopach. The geology report is in Volume A-3 of the MRP. The information is adequate for the Division to use in its analysis.
- *A description of monitoring, if any, needed to determine the commencement and degree of subsidence so that, when appropriate, other measures can be taken to prevent, reduce, or correct material damage.* The Permittee did not change the monitoring program, which consists of a commitment to conduct annual aerial surveys. In addition, The Permittee committed to conduct infrared aerial photography each year on the North Lease area.

The Division now requires permittees to commit to conduct on the ground reconnaissance at least six months after a panel has been mined out, but no more than twelve months afterwards.

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- *Except for those areas where planned subsidence is projected to be used, a detailed description of the subsidence control measures that will be taken to prevent or minimize subsidence and subsidence-related damage, including, but not limited to: backstowing or backfilling of voids; leaving support pillars of coal; leaving areas in which no coal is removed, including a description of the overlying area to be protected by leaving the coal in place; and, taking measures on the surface to prevent material damage or lessening of the value or reasonably foreseeable use of the surface.* The Permittee proposes to use longwall mining methods for all areas of the North Lease. All mined area with the exception of mains are scheduled to be subsided. The information is adequate for the Division to use when analyzing when and where subsidence could occur.
- *A description of the anticipated effects of planned subsidence, if any.* In Section 4.17.1 of the MRP, The Permittee specifically mentions the anticipated subsidence effects in the North Lease area. The Permittee does not anticipate any subsidence related impacts on the pack trail in the bottom of Winter Quarter Canyon. The Permittee states that no subsidence will occur in the area until permission is granted by the USFS and the Division. The Permittee does not specifically state what the subsidence effects will be.

The Permittee must submit a detailed description of the anticipated effects of subsidence for the North Lease area. The description must contain site-specific references such as analysis of annual subsidence reports for mines in the area and other historical information.

The Permittee must address three specific items: 1) the potential for subsidence induced escarpment failures and landslides, 2) how subsidence could cause damage to existing surface structures (trails) and 3) damage or alter the flow of perennial streams.

The Permittee must explain why they anticipate only 2 to 4 feet of subsidence when 9 to 11 feet of coal will be mined. The Forest Service estimates that subsidence would be 70% of the mined height, which would be 7 feet.

The Permittee must explain why they projected that subsidence cracks would occur on the hillsides but not in the valley bottoms.

The Permittee must include a discussion on how subsidence will be affected by faults in the area. The Permittee could include information on subsidence in faulted areas at or near the Skyline Mine.

- *A description of the measures to be taken to mitigate or remedy any subsidence-related material damage to, or diminution in value or reasonably foreseeable use of the land, or structures or facilities to the extent required under State law.* In Section 4.17.4, Mitigation of Subsidence Effects, of the MRP, The Permittee states, “that mitigation will

be contingent upon the findings of the subsidence monitoring program. Surface subsidence experienced to date, as shown in the 1987 and 1988 annual reports, has been less than 50% of the mined height even after 2 years has passed. As data are collected, methods of mitigation will be formulated.” The Permittee must update the subsidence mitigation plan because they have sixteen years of additional data.

The Permittee stated that if any water rights were impacted, they would be replaced as discussed in Section 2.5.2 of the MRP. In that section, The Permittee states “The current 2002 mine plans do not anticipate longwall mining in the Winter Quarters area, thus allowing the mine time to obtain the needed baseline data.

Additional information on how The Permittee will mitigate loss of state appropriated water rights is in Section 2.5.3, Alternative Water Supply, of the MRP. In that section, The Permittee mentions that mitigation methods include sealing cracks in streambeds and providing water from other sources. The Permittee did not list specific methods on how they would seal cracks. The Permittee must list specific methods for sealing cracks in streambeds and site references for the effectiveness each method.

In Section 2.5.2 of the July 1, 2004 submittal, the Permittee state:

Due to the high shale content of the Blackhawk Formation, recharge to the deep ground water system through the Blackhawk Formation is slow. Fractures in the formation seal readily due to swelling of the bentonitic shale when wet.

The Permittee needs to give specific references for bentonite clays being in the Blackhawk Formation and the bentonite clays will seal factures.

The Permittee must also give specific references for the in-situ stress studies in Section 2.2.6 of the MRP

- *Other information specified by the Division as necessary to demonstrate that the operation will be conducted in accordance with the performance standards for subsidence control.* The Division does not need any other information at this time.

Findings:

The information in the application is not considered adequate to meet them minimum requirements of the regulations. Before approval, The Permittee must provide the following in accordance with:

R645-301-525.420, Drawing 4.17.1-1, Extent of planned and subsidence areas must show the extent of possible subsidence in the North Lease area. Three specific

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items that must be addressed are 1) the potential for subsidence induced escarpment failures or landslides, 2) damage to existing structures (trails) and potential damage or alteration of flow to perennial streams. The Permittee must also state why they expect only 2 to 4 feet of subsidence if 9 to 11 feet of coal is mined. The Permittee must also include a discussion of how subsidence will be affected by faults in the area.

R645-301-525.440 and R645-525.490, The Permittee must incorporate a plan to have a on the ground survey for the surface are over each panel mined no earlier than six months, but no more than twelve months after mining of the panel ceased to inspect for surface subsidence features or develop an alternative plan that will detect surface subsidence features.

R645-301-525.460, The Permittee must submit a detailed description of the anticipated effects of subsidence for the North Lease area. The description must contain site-specific references such as analysis of annual subsidence reports for mines in the area and other historical information. The Permittee must specifically state what effects subsidence is expected to have on the perennial streams in the North Lease area. The Permittee must state why they projected surface cracks to occur on the hillsides but not with in the valley bottoms.

R645-301-525.440, The Permittee must update the subsidence monitoring program by incorporating the data they have collected since 1988. In Section 4.17.4 of the MRP, The Permittee committed to update the monitoring program as more data became available.

R645-301-525.480, The Permittee must include a description of the methods that could be used to repair perennial stream channels. The description will include references stating the results of such methods in similar conditions.

R645-301-122, The Permittee must include references for claims that the Blackhawk Formation contains benonite clays that the clays will seal subsidence cracks. The Permittee must also give specific references for the in-situ stress studies in Section 2.2.6 of the MRP.

SLIDES AND OTHER DAMAGE

Analysis:

The addition of the North Lease will not effect this section.

Findings:

The information in the application is considered adequate to meet them minimum requirements of the regulations.

RECOMMENDATIONS:

The Division should deny the application until all of the above mentioned deficiencies are adequately addressed.